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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,128	11/21/2001	Thomas L. Toth	gems8081.110	1209
27061	7590	11/22/2004	EXAMINER	
ZIOLKOWSKI PATENT SOLUTIONS GROUP, LLC (GEMS)			HO, ALLEN C	
14135 NORTH CEDARBURG ROAD			ART UNIT	
MEQUON, WI 53097			PAPER NUMBER	
			2882	

DATE MAILED: 11/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,128

Applicant(s)

TOTH ET AL.

Examiner

Allen C. Ho

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Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 12-37 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for generating a current profile of an x-ray tube, does not reasonably provide enablement for generating a tube current profile. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification does not enable any person skilled in the art to generate a current profile for other kinds of tubes in the circuit such as a vacuum tube or thyratron tube for controlling and regulating current in the circuit.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12, 16, 17, 32, 33, 35, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Toth (U. S. Patent No. 5,400,378).

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With regard to claim 12, Toth disclosed a method of processing imaging data for a radiation emitting medical imaging device, the method comprising: acquiring imaging data of a subject (110); generating a set of projections (S_0 , S_{90}) for an VOI having a plurality of sub-volumes; acquiring a target noise index (desired image quality, *i. e.*, noise level, column 2, lines 20-36); generating a tube current profile according to the target noise index (column 6, lines 18-36); and enabling interactive adjustment of the generated tube current profile to convey a dose specific for each sub-volume in the VOI such that diagnostic quality is variable across the VOI (column 2, lines 37-49).

With respect to claims 16 and 17, Toth disclosed the method of claim 12, further comprising the step of adjusting at least one of a noise index and a relative dose index to acquire the image data of the subject (column 2, lines 37-49).

With regard to claim 32, Toth disclosed a radiation emitting medical device comprising: means (30) for receiving scan parameter (column 4, lines 19-21); means (26) for adjusting the scan parameters automatically to generate a desired target image quality across a VOI for a patient; means (26) for modifying a tube current profile based on the adjusted scan parameters to account for sub-volumes of elevated interest such that radiation dose to the sub-volumes of elevated interest exceeds that of other sub-volumes of the VOI; and means (10) for scanning the patient using the modified tube current profile to reconstruct an image of the patient with image quality for the sub-volumes of elevated interest exceeding that of the other sub-volumes of the VOI (column 2, lines 37-49).

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With respect to claim 33, Toth disclosed the medical device of claim 32, wherein the target image quality is determined by a target image noise index (column 1, line 49 - column 2, line 3).

With regard to claims 35 and 36, Toth disclosed the medical device of claim 32, wherein the means for modifying a tube current profile includes one of graphical adjustment and direct entry adjustment (column 4, lines 19-29).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 13, 19, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toth (U. S. Patent No. 5,400,378) as applied to claims 12 and 32 above, and further in view of Toth (U. S. Patent No. 5,379,333).

With regard to claims 13 and 19, Toth (U. S. Patent No. 5,400,378) disclosed the method of claim 12. However, Toth failed to teach that the method further comprises the step of varying an application of a patient dose for each rotation of an x-ray source within a sub-volume in the VOI to limit x-ray exposure to sensitive organs of a patient.

Toth (U. S. Patent No. 5,379,333) disclosed a method that comprises the step of varying an application of a patient dose for each rotation of an x-ray source within a sub-volume in the VOI to limit x-ray exposure to sensitive organs of a patient (column 4, lines 63-68).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to vary an application of a patient dose for each rotation of an x-ray source within a sub-volume in the VOI to limit x-ray exposure to sensitive organs of a patient, since a person would be motivated to avoid harming a sensitive organ with excessive x-ray dose.

With regard to claim 37, Toth (U. S. Patent No. 5,400,378) disclosed the medical device of claim 32. However, Toth failed to teach that the means for modifying a tube current profile includes a means for modifying the tube current in sensitive organ regions for each gantry rotation.

Toth (U. S. Patent No. 5,379,333) disclosed a means for modifying the tube current in sensitive organ regions for each gantry rotation (column 4, lines 63-68).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a means for modifying the tube current in sensitive organ regions for each gantry rotation, since a person would be motivated to avoid harming a sensitive organ with excessive x-ray dose.

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toth (U. S. Patent No. 5,400,378) as applied to claim 12 above.

With regard to claim 14, Toth disclosed the method of claim 12. However, although Toth disclosed a graphical user interface (30, 32) that displays the reconstructed image and other data (column 4, lines 19-29), Toth fails to teach the step of plotting the tube current profile on the graphical user interface.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to display the x-ray tube current profile, since a person would be motivated to visually check the x-ray tube current profile before imaging a patient.

With respect to claim 15, Toth disclosed the method of claim 14, wherein user modulation of a portion of the plotted x-ray tube current profile on the graphical user interface causes the noise index to vary for the portion of the current profile modulated (column 2, lines 37-49).

8. Claims 18 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toth (U. S. Patent No. 5,400,378) as applied to claims 12 and 32 above, and further in view of Lavin *et al.* (U. S. Patent No. 5,772,585).

With respect to claim 18, Toth disclosed the method of claim 12, wherein the step of generating a set of projections includes the step of receiving a patient input (acquiring a patient's scout data 110). However, Toth failed to teach accessing a patient demographic database.

Lavin *et al.* disclosed a demographic database for managing patient medical information. The database contains, among other things, physician's diagnosis. In addition, this database is accessible over a network.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to set up a networked demographic database for managing patient medical information, since a person would be motivated to create a centralized database for storing and organizing patient medical information. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to access a patient's demographic information when generating a set of projections, since a person would be motivated to confirm a

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patient's identity and to generate a set of projections appropriate with respect to VOI based on a physician's diagnosis.

With respect to claim 34, Toth disclosed the medical device of claim 32, wherein the target image quality is determined by an x-ray tube current (column 1, line 49 - column 2, line 3). However, Toth failed to teach that the image quality is determined by a demographic database.

Lavin *et al.* disclosed a demographic database for managing patient medical information. The database contains, among other things, physician's diagnosis. In addition, this database is accessible over a network.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to set up a networked demographic database for managing patient medical information, since a person would be motivated to create a centralized database for storing and organizing patient medical information. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine the target image quality based on a demographic database, since a person would be motivated to determine the target image quality based on physician's diagnosis.

Allowable Subject Matter

9. Claims 1-11 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 1-11, the prior art fails to teach or fairly suggest a method of processing imaging data for a radiation emitting medical imaging device comprising the steps of

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automatically generating a predicted noise index from the received set of scan parameter values and generating an x-ray tube current profile based at least on the predicted noise index as claimed.

Response to Arguments

11. Applicant's arguments filed 21 September 2004 with respect to the figures have been fully considered and are persuasive. The objection of the figures has been withdrawn.

12. Applicant's arguments filed 21 September 2004 with respect to claim 34 have been fully considered and are persuasive. The objection of claim 34 has been withdrawn.

13. Applicant's arguments with respect to claims 12-18 and 32-37 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Patent Examiner
Art Unit 2882

16 November 2004